

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Claims:**

1-3. (Cancelled)

4. (Previously Presented) A method for converting chemical energy into a useful form, comprising:

using reactants and catalyst to create highly vibrationally excited molecules, the highly vibrationally excited molecules being created in a catalytic reaction where at least some of products of the catalytic reaction desorb and leave a surface of the catalytic reaction;

coupling the highly vibrationally excited molecules with electrons by placing the highly vibrationally excited molecules near a conducting surface for electron-jump effect to occur;

causing at least some of vibrational energy of the highly vibrationally excited molecules to transfer to the electrons of the conducting surface, resulting in excited carriers being created;

collecting the excited carriers; and

converting energy of the excited carriers by energizing with the excited carriers to energize a semiconductor device to emit electromagnetic radiation.

5. (Previously Presented) The method of claim 4, wherein the semiconductor device is a light emitting diode.

6. (Previously Presented) The method of claim 4, wherein the semiconductor device is a quantum well structure.

7-26. (canceled)

27. (Previously Amended). The method of claim 4, wherein the converting includes converting flux of the excited carriers into an inverted population of carriers in a semiconductor of the semiconducting device.

28. (Previously Presented) The method of claim 27, further including:  
extracting energy stored in the inverted population of carriers as electromagnetic radiation.

29. (Previously Presented) The method of claim 28, wherein the method further includes causing stimulated emission to extract the electromagnetic radiation.

30-49. (Cancelled)